Re: FFTW versus NRC FFT

Source: http://sci.tech−archive.net/Archive/sci.math.num−analysis/2007−01/msg00037.html

- *From*: stevenj@xxxxxxxxxxx

- *Date*: 4 Jan 2007 11:02:05 −0800

Blacky wrote:

> I have a problem with the FFTW algorithm, special the discrete sine transform. Before exchanging the FFT routine known from the NRC (numerical recipes) book by that given from FFTW, I performed some tests. I started with the function exp(−t) which can be analytically transformed. Applying both codes for that function the FFTW algorithm limits into a function value of one not zero as one would think and what the FFT NRC code does. What is the problem here? The FFT NRC code is checked by using it before on many problems.

Most likely you are confusing the different types of DST. You should compare the definition in NRC with:

http://www.fftw.org/doc/1d−Real_002dodd−DFTs−_0028DSTs_0029.html

In particular, if I remember correctly, the "sinft" transform that NRC introduces corresponds to the type−I DST, or RODFT00 in FFTW (as defined by the above link). In your code, however, you are calling RODFT10, corresponding to a type−II DST.

Rest assured that FFTW's sine and cosine transforms are well tested and compute exactly what the FFTW manual says. You only have to call it correctly, and call the routine corresponding to the transform you want.

Steven

PS. Grrr, Numerical Recipes just changed their online version to make you jump through several hoops in order to read it.

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